

**METHODS AND COMPOSITIONS FOR THE
TREATMENT OF EMPHYSEMA USING 13-*CIS*-RETINOIC ACID**

ABSTRACT

5 The current invention is directed to methods of treating or preventing emphysema,
pharmaceutical compositions suitable for the treatment or prevention of emphysema and
methods for delivering formulations into the lung of a mammal suffering from emphysema.

10 More generally, the invention encompasses the use of 13-*cis*-retinoic acid to treat or
prevent certain chronic obstructive airway disorders, particularly chronic obstructive
pulmonary disease including chronic bronchitis, emphysema and asthma in mammals,
especially humans that smoke or smoked cigarettes. In another aspect, the present invention
encompasses the use of pharmaceutical compositions of 13-*cis*-retinoic acid to treat
emphysema. Moreover, the current invention encompasses the use of electrohydrodynamic
aerosol devices, aerosol devices and nebulizers to deliver formulations of 13-*cis*-retinoic acid
into the lung of a mammal suffering from emphysema. The invention also encompasses the
systemic use as well as the local use of 13-*cis*-retinoic acid. In a another aspect the current
invention encompasses a pharmaceutical composition for preventing emphysema in a human
at risk of emphysema through administration of a amount of 13-*cis*-retinoic acid, or a
pharmaceutically acceptable salt, hydrate, solvate, or pro-drug thereof in a pharmaceutically
acceptable carrier, that is sufficient to prevent emphysema.